



June 28, 2011

Beacon Power Corporation Comments to California Public Utilities Commission

CPUC Electric Energy Storage Proceeding Rulemaking 10-12-007

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Beacon Power Overview



- Manufacturer and merchant developer of flywheel storage
 - Frequency Regulation
- Successful grid demonstration project in CA in 2006
- Operating up to 3 MW in ISO-NE since November 2008
 - 2011: Operating first commercial-scale 20 MW plant in NYISO
 - Developing second 20 MW plant in PJM



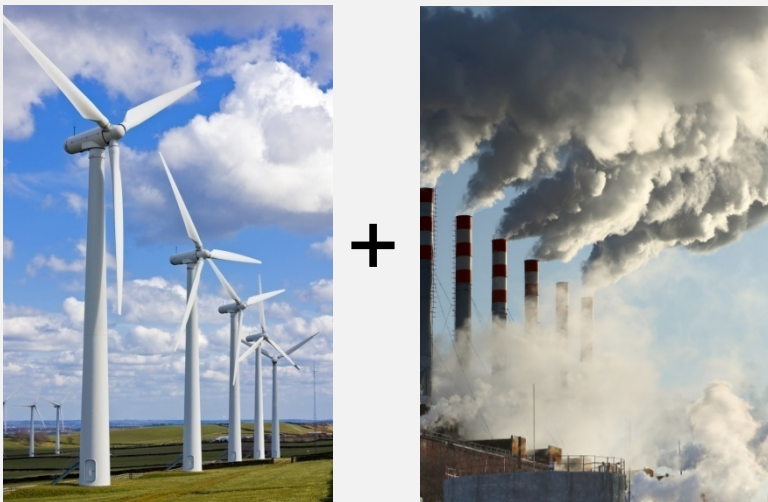
Flywheels in ISO-NE



20 MW plant in Stephentown, NY

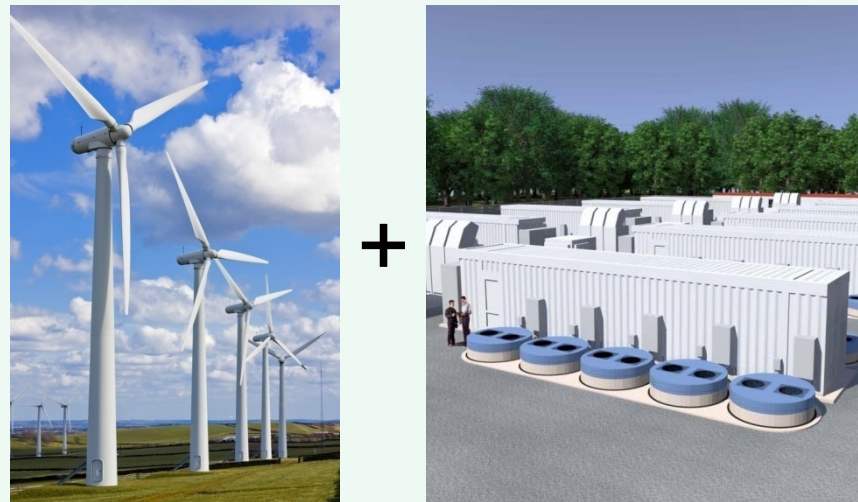
Increased Regulation is necessary to meet CA Renewable Goals

Does this make sense?



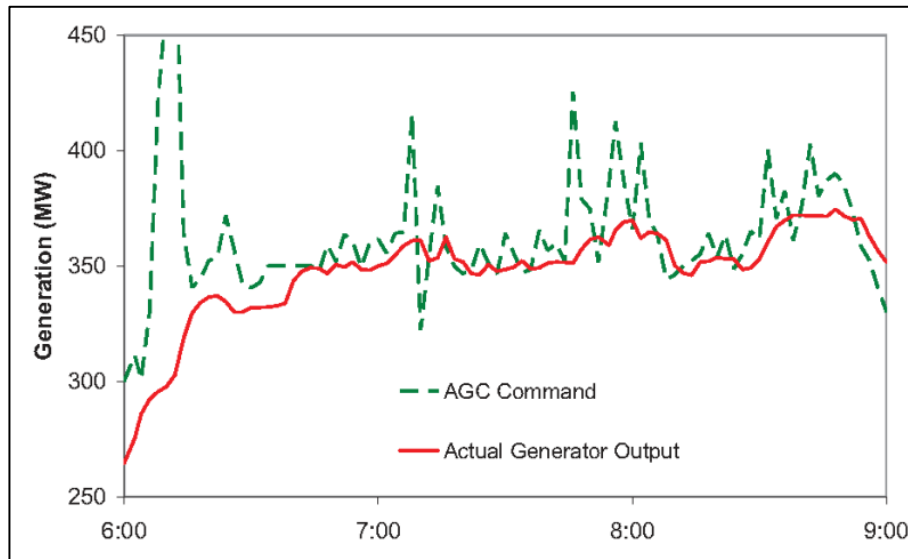
- Regulation provided by generators varying output
 - Decreases efficiency
 - Increases fuel consumption
 - Requires more maintenance
 - Increases emissions

Smarter Solution: Storage

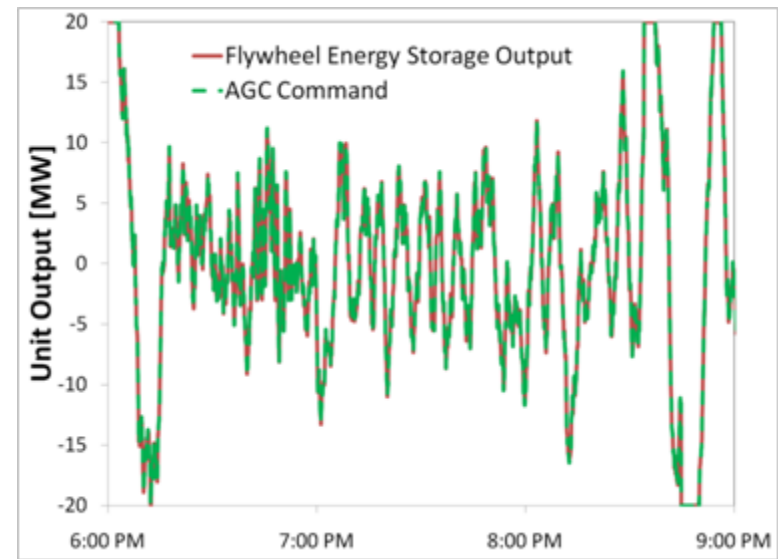


- Store energy when supply exceeds load; inject energy when load exceeds supply
 - High round trip efficiency
 - Low operating cost
 - **Zero direct emissions**
 - **Fast accurate response**

Fast Regulation: Speed Matters...



Slow ramping
Generator

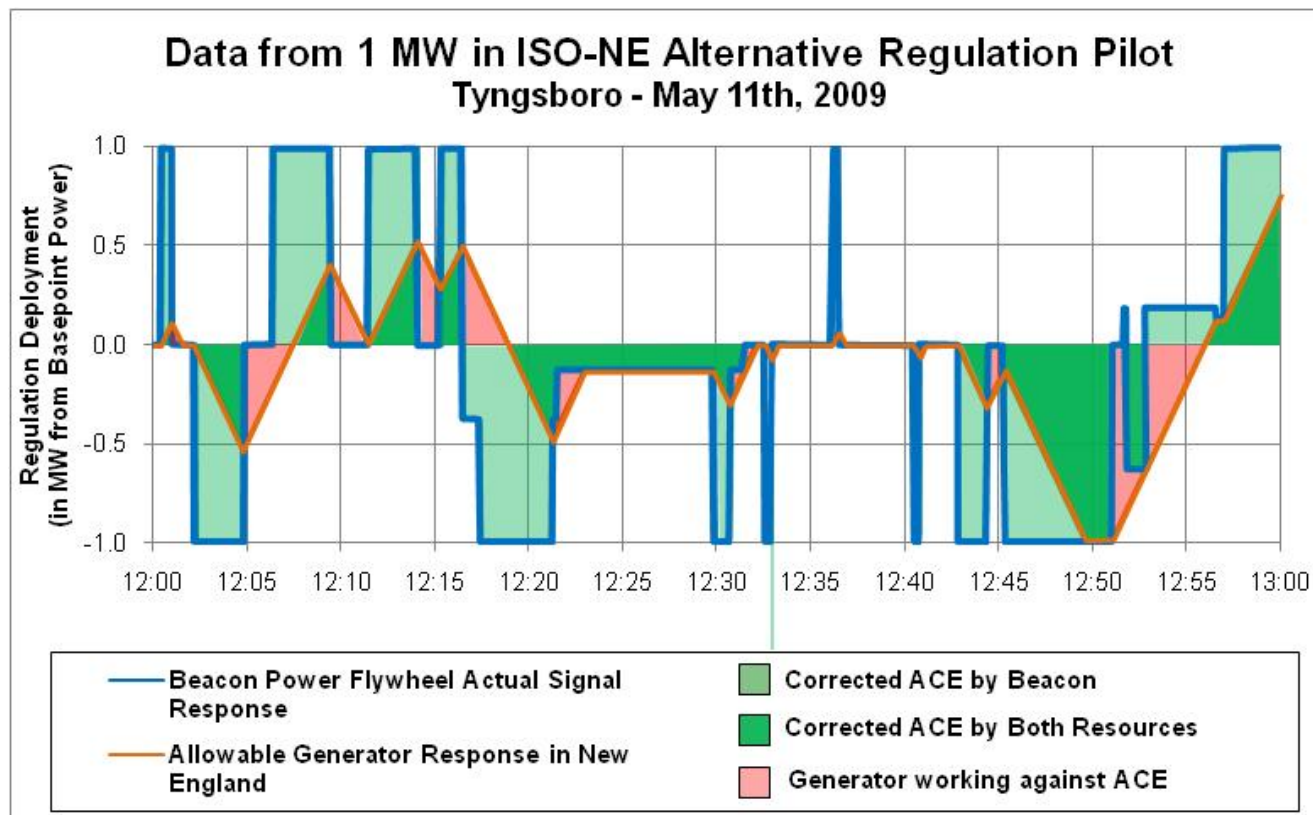


Fast response
Flywheel Energy Storage

**Advanced Storage provides fast accurate response
to the frequent and unpredictable changes in renewable output**

Fast response resources can control the grid with less MWs

- Fast responding flywheels provided 4x more Regulation Service per MW



1 MW of Regulation		
	Flywheel	Generator
ACE Corrected	0.48 MWh	0.18 MWh
Against ACE	0 MWh	-0.07 MWh
Net ACE Correction	0.48 MWh	0.11 MWh
Mileage	25 MW miles	8 MW miles

**Flywheels provide more Regulation Service per MW;
Enabling less total procurement and cost**

Data from Beacon Power's NYISO plant demonstrates storage benefits



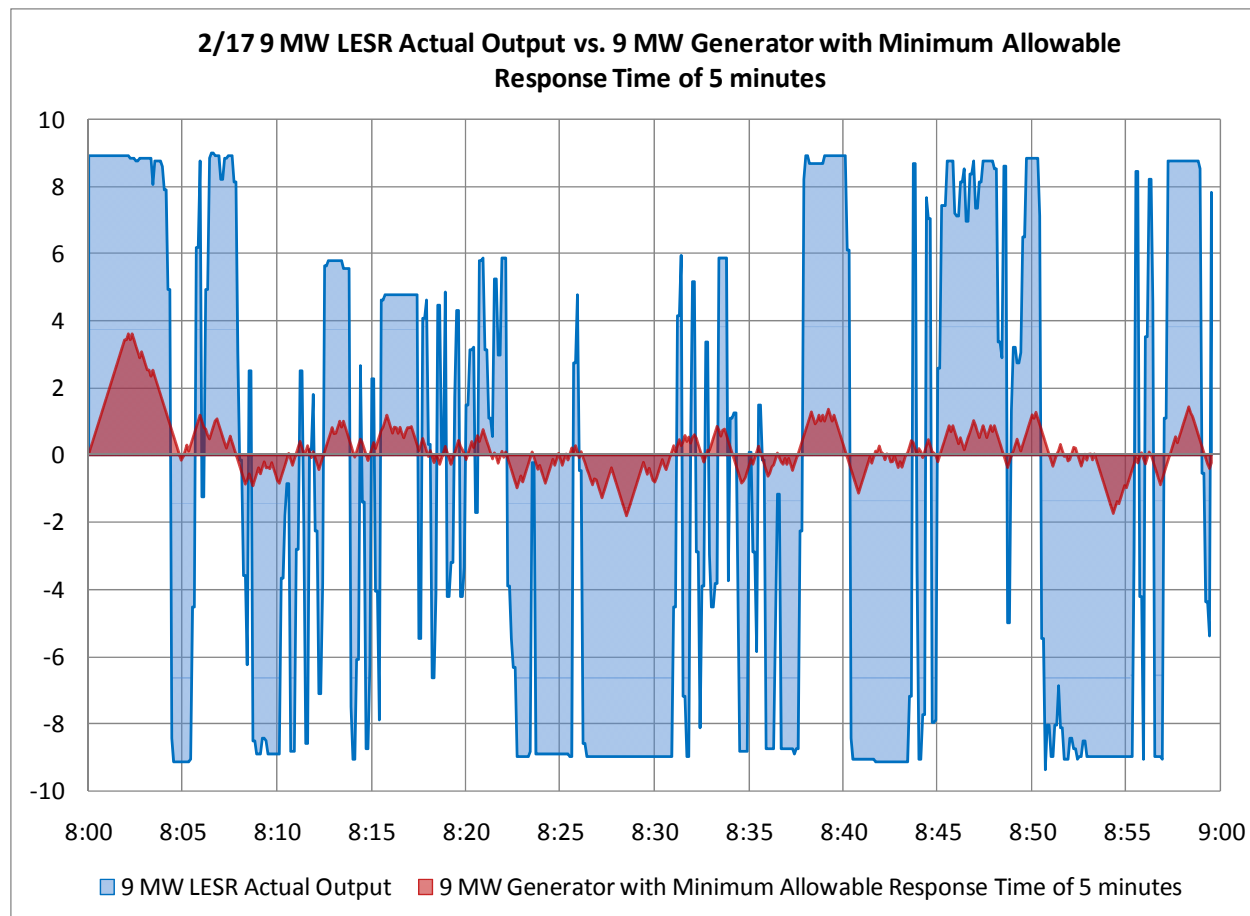
- NYISO utilizing fast response storage as “first responders” to ACE

Reliability Benefits:

- Respond near instantaneously to unpredictable changes in wind
- Improve control performance

Cost benefits:

- Reduce high-cost deployments on traditional providers
- Enables generators to operate closer to economic optimum
- Reduce wear and tear on generators



Fast response storage provides cost and reliability benefits for ratepayers

Policy Recommendations



- Remove barriers to advanced storage technologies in CAISO Regulation market
 - Support implementation of Regulation Energy Management (REM)
- Compensate the additional value provided to the grid by fast responding Regulation technologies in CAISO
 - FERC issued NOPR to reform Frequency Regulation Compensation (February 17, 2011)
 - Performance (“mileage”) payment based on quality, speed and accuracy
- Resource Adequacy and long-term procurement requirements for storage
 - Include storage resources that only provide ancillary services
- Allow storage to participate in RPS



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